

## **Chapter 2: Planning, Research, and Development**

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The CSFII/DHKS 1994–96 was preceded by a variety of planning, research, and development activities, including an evaluation of previous survey operations, collaborative efforts, a contracting process, and a pilot study.

#### **Evaluation of Previous Survey Operations**

Planning for the CSFII/DHKS 1994–96 began in 1991 with evaluation of the management, content, and procedures of the CSFII/DHKS 1989–91 and the Nationwide Food Consumption Survey 1987–88 conducted by USDA. Every facet of the survey process from the sample design and data collection to the transmission of data to ARS was examined and redesigned, as necessary, to improve the quality of the data and the timeliness of its release. Staff working groups on survey design and planning and on questionnaire development were established to plan and design the survey and to revise the CSFII/DHKS 1991 questionnaires and other interview aids for use in the 1994–96 survey. These groups continued to meet throughout the survey planning period.

#### **Collaborative Efforts**

Collaborative efforts included the establishment of the Continuing Survey Users' Group (CSUG); an interagency agreement with the National Agricultural Statistics Service for statistical consultation; two interagency agreements with the Bureau of the Census for consultation, collaboration, and research on survey design, conduct, and management; and a cooperative research agreement with the University of Texas-Houston School of Public Health for the development of Survey Net, a computer-assisted food coding system for use with the CSFII 1994–96. A cooperative research agreement with Iowa State University included consultation on survey design.

#### **Federal collaboration**

The mission of the Food Surveys Research Group of the ARS Beltsville Human Nutrition Research Center is to "monitor and assess food consumption and related behavior of the U.S. population by conducting surveys and providing the resulting information for food- and nutrition-related programs and public policy decisions." To ensure that the survey was responsive to the program and policy needs of Federal agencies, USDA convened the Continuing Survey Users' Group.

Proposed changes to the CSFII/DHKS 1991 questionnaires in preparation for CSFII/DHKS 1994–96 provided the basis for the meetings of the CSUG. CSUG served as the principal source of Federal user input on the survey design (see chapter 3) and on survey questionnaires (see chapter 4).

CSUG included representatives from Federal agencies that are major users of USDA food consumption survey data or that conduct major Federal surveys. CSUG members included

- Bureau of the Census, U.S. Department of Commerce
- Cooperative State Research, Education, and Extension Service, USDA
- Economic Research Service, USDA
- Environmental Protection Agency
- Federal Trade Commission
- Food and Drug Administration, U.S. Department of Health and Human Services
- Food and Consumer Service, USDA
- Food Safety and Inspection Service, USDA
- National Cancer Institute, U.S. Department of Health and Human Services
- National Center for Health Statistics, U.S. Department of Health and Human Services
- National Heart, Lung and Blood Institute, U.S. Department of Health and Human Services
- National Marine Fisheries Service, U.S. Department of Commerce
- National Program Staff, Agricultural Research Service, USDA.

Meetings with CSUG to discuss proposed changes to the CSFII/DHKS began in late 1991. In addition to full meetings for general discussion of the questionnaires and survey design, several smaller meetings were held to discuss specific topic areas. For example, the Food and Drug Administration participated in the development of food labeling questions for the DHKS that were consistent with new regulations. The Food and Drug Administration, Environmental Protection Agency, and National Heart, Lung and Blood Institute participated in the development of new questions related to sources of water and recreational and subsistence fishing. Individual CSUG members were consulted throughout the questionnaire development process. For example, Food and Consumer Service and Economic Research Service were consulted on the development of the list of sources of foods.

Comparability among the many Federal surveys that are a part of the National Nutrition Monitoring and Related Research Program is important for enhancing the capability to establish links among the surveys. The need for such

comparability was considered during the planning and development of the CSFII/DHKS 1994–96 and was balanced against current user needs.

The recommendations of the Survey Comparability Working Group of the Interagency Board for Nutrition Monitoring and Related Research (IBNMRR) on population descriptor variables were reviewed and incorporated into the questionnaires, where appropriate. For example, race and ethnicity questions provided the categories recommended in the report from the Survey Comparability Working Group (Interagency Board for Nutrition Monitoring and Related Research 1992). Also, comparability of food and nutrient intake between the CSFII 1994–96 and the Third National Health and Nutrition Examination Survey was enhanced by the 24-hour dietary recall method developed for the CSFII 1994–96. Another example of improved comparability was a change in the target population for the CSFII/DHKS 1994–96 to include all 50 states, rather than the 48 states targeted in the past. The definition of a housing unit was changed to conform with the definition for the 1991 Current Population Survey, Bureau of the Census. The latter two changes were recommended by the Research Triangle Institute in its report on USDA and National Center for Health Statistics dietary survey sampling designs (Hubbard et al. 1991).

The National Agricultural Statistics Service provided statistical expertise and consultation in the development of the survey sample design. Review of the sample design for CSFII 1994–96 was also provided by Iowa State University (ISU).

The decision to collect 2 days of dietary intake data was based in part on concerns regarding respondent burden. The decision was also based on analyses performed by Iowa State University supporting the use of 2 days of dietary intake to estimate distributions of usual nutrient intakes (Fuller 1994). Analyses performed by Iowa State University supported the decision to separate the 2 days of intake by at least 3 days to achieve statistical independence (An and Carriquiry 1991).

Staff of the Demographic Surveys Division, Bureau of the Census, helped develop the statement of work and the independent government cost estimates needed in the contracting process. The division also provided Census Bureau listing rules, instruction manuals, and other reference materials. It helped prepare early drafts of the questionnaires and pretested the DHKS questionnaire. The Census Bureau's Center for Survey Methods Research conducted cognitive research to improve the quality of the dietary data that were to be collected in the 1994–96 survey (see chapter 4).

## University of Texas-Houston School of Public Health

The cooperative research agreement that began in 1990 with the University of Texas-Houston School of Public Health yielded improved methodology for food coding and for the management of the extensive technical support system required for food coding and nutrient analysis of the data. Several new inhouse software products and database management procedures, utilizing the latest computer technology, resulted from this agreement and greatly increased the efficiency of processing the data.

Survey Net is the most visible of the software products. It is a computer-assisted food coding system operating on a network that allows immediate access by all users to central technical databases, primarily the survey food coding, nutrient, and recipe databases. The CSFII contract specified that this system be installed and used by the contractor for coding all foods reported as consumed by survey respondents. The system was also used by ARS during the survey to review and finalize coded food data.

During the initial planning phase for Survey Net, the following goals were established: (1) to reduce the time required for coding food consumption data, (2) to provide flexibility in the food coding system, while maintaining a structure comparable to past surveys, and (3) to increase oversight of food coding operations conducted by survey contractors. Features were designed to meet these goals (see chapter 7).

Cooperation with the University of Texas also produced a new recipe processing system for managing the recipe database and calculating the nutrient content of recipes; a program for nutritional analysis of Survey Net output; administration software for tracking and managing Survey Net files containing unknown foods and recipe modifications; new relational database formats and routines for managing 18 data files associated with the 3 central databases (over 60 megabytes of data); and a data conversion pipeline for moving updated database files from the management arena into Survey Net. In addition, the Food Intake Analysis System was developed to provide user-friendly software, comparable to Survey Net, for researchers who wish to use CSFII technical databases for their own research (see chapter 7).

### **Contracting Process**

Results from the staff review of survey operations and suggestions from collaborating agencies were incorporated into the statement of work, which was

the basis for the request for proposals for the CSFII/DHKS 1994–96. Staff from the National Center for Health Statistics, Demographic Surveys Division, and National Agricultural Statistics Service reviewed the statement of work. USDA followed standard government contracting procedures. In September 1992, Westat was awarded the contract to conduct the CSFII/DHKS 1994–96.

The contract for the survey was fixed-price and included 175 deliverables per data collection year. It established strong management and quality control procedures and redesigned data collection methods and procedures for processing. The contract specified annual response rates for each type of interview and outlined procedures for achieving those rates. It also specified the number of individuals to be interviewed in the 40 sex-age and income subdomains for 3 years to meet precision requirements (see chapter 3).

### **Pilot Study**

As part of the contract, a pilot study duplicating the planned survey design on a small scale was conducted from April to June 1993. CSUG members reviewed the pilot study questionnaires. The Office of Management and Budget requested that the pilot study include a test of the effects of a respondent incentive—an insulated nylon sack—on response rates. USDA had included an option for a third nonconsecutive day of food intake data collection in the pilot study; however, due to concerns about maintaining optimal response rates with the increase in respondent burden, this option was not exercised.

Questionnaires, data collection methods, field management procedures and instructional manuals, data entry and processing procedures, and electronic data delivery planned for use in the CSFII/DHKS 1994–96 were tested during the pilot study, evaluated, and revised as appropriate. Twenty-two interviewers and two senior interviewers were trained for the pilot study in a 7-day session. The training provided extensive hands-on practice with the questionnaires and interview aids through the scripted mock interviews and practice interviews (see chapter 6).

The pilot study was conducted at 10 sites across 4 regions of the country and in urban and rural areas. To capture experiences and provide feedback on procedures and materials, interviewers maintained a notebook as part of their review of completed questionnaires, mailed back a debriefing questionnaire, and attended an in-person debriefing. Taped interviews and field observations of interviews provided additional information for identifying areas for improvement. The interviews were observed by USDA and Westat staff in the respondents' homes.

Between April and June 1993, 434 sample persons were identified for the pilot study based on 623 screened households (98.4-percent response rate). Of the 434, 351 completed day-1 and day-2 individual intake interviews, for a response rate of 81 percent. Additionally, 188 household questionnaires were completed for an 87 percent response rate, and 115 DHKS questionnaires were completed for an 88 percent response rate.

The pilot study provided an excellent opportunity to further refine the quality of survey instruments and improve the efficiency of survey operations. Modifications that had been made to the CSFII 1989–91 questionnaires and data collection procedures tested in the pilot study facilitated the collection of high-quality data in the main survey. Feedback from interviewer field notebooks, mailed questionnaires, and in-person debriefings after the pilot study resulted in further revisions to the questionnaires and procedures. High response rates were achieved. Also, Survey Net was an efficient system for processing dietary intake data more quickly and precisely. Electronic delivery of survey data from the contractor to USDA each week was successful. Automated data-tracking systems, developed by Westat for use with the CSFII/DHKS, were effective in monitoring data collection and processing activities, and survey management software used in monitoring the status of data review and editing was a valuable tool. The incentive was approved by the Office of Management and Budget for use in the CSFII/DHKS 1994–96.

## References

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